

Interannual Gravity Variations

P Gegout¹ (33-88-41-66-94; pascal@selene.u-strasbg.fr)

D Dong² (818-393-1827; danan.dong@jpl.nasa.gov)

J O Dickey² (818-354-3235; jean.dickey@jpl.nasa.gov)

¹Institut de Physique du Globe de Strasbourg, Laboratoire de Dynamique Globale,
5, rue René Descartes, 67084, Strasbourg Cedex, France

²Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove
Drive, Pasadena, Ca 91109, United States

Temporal variations of the flattening of the geopotential are investigated using the geodetic satellite Lageos from 1980 to 1998. Although Lageos effective flattening exhibits previously reported seasonal variations, we focus here on its interannual variability. Gravity variations induced by atmospheric mass and groundwater are estimated and compared to Lageos determination. A regional analysis shows this interannual variability of atmospheric pressure (appropriately weighted for C_{even}) to be mostly generated by mass redistributions in Antarctica. After the removal of a composite annual cycle, the use of multi-channel singular spectral analysis reveals strong similarities between observed and modeled interannual variabilities and the Southern Oscillation Index. We report this new signature of the El Niño/Southern Oscillation and discuss its link with mass redistributions in polar regions.

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3. (a) J O Dickey
Jet Propulsion Laboratory,
California Institute of
Technology, 4800 Oak Grove
Drive
Pasadena, Ca 91109
United States
(b) 818-354-3235
(c) 818-393-6890
(d) jean.dickey@jpl.nasa.gov
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